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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/633,002 | 08/04/2000 | Keiji Ishibashi | | 2248 |

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EXAMINER

MARKHAM, WESLEY D

ART UNIT

PAPER NUMBER

1762

DATE MAILED: 06/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------|------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/633,002 | ISHIBASHI, KEIJI |
| | Examiner | Art Unit |
| | Wesley D Markham | 1762 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 14 April 2003.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 11-16 and 27-32 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 11-16 and 27-32 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 04 August 2000 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

- 1) Certified copies of the priority documents have been received.
- 2) Certified copies of the priority documents have been received in Application No. _____.
- 3) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____

4) Interview Summary (PTO-413) Paper No(s) _____

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____

DETAILED ACTION

Response to Amendment

1. Acknowledgement is made of applicant's amendment D, filed as paper #14 on 4/14/2003 (with a certificate of mailing dated 4/7/2003), in which a substitute abstract of the disclosure was submitted, Claims 11 and 27 were amended, and Claims 21 – 26 were canceled. Claims 11 – 16 and 27 – 32 are currently pending in U.S. Application Serial No. 09/633,002, and an Office Action on the merits follows.

Drawings

2. The formal drawings (2 sheets, 3 figures) filed on 8/4/2000 are approved by the examiner.

Specification

3. The objection to the specification, specifically to the abstract of the disclosure, set forth in paragraph 4 of the previous Office Action (i.e., the non-final Office Action, paper #12, mailed on 12/10/2002), is withdrawn in light of applicant's amendment D in which an acceptable, single-paragraph abstract was submitted.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. The rejection of Claims 21 – 26 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement, set forth in paragraphs 6 – 7 of the previous Office Action, is withdrawn in light of applicant's amendment D in which Claims 21 – 26 were canceled.
6. Claims 11 – 14 and 27 – 30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
7. Specifically, the applicant has amended independent Claim 11 (from which Claims 12 – 14 depend) and independent Claim 27 (from which Claims 28 – 30 depend) to require that the cleaning gas contain at least one halogen atom. As support for this limitation, the applicant cites the specification, page 5, lines 14 – 17. The examiner has reviewed the cited portion of the specification and the specification as a whole. The examiner notes that the applicant's specification as originally filed discloses various cleaning gases that contain/comprise chlorine and/or fluorine (page 5, lines 14 – 17 of the specification) and teaches that "a fluorine- or chlorine-containing gas is suitably used" (page 11, lines 20 – 24 of the specification). However, the subject matter of the cleaning gas containing at least one halogen atom as recited in amended independent Claims 11 and 27 opens the claims to gases that contain, for

example, bromine and/or iodine. This subject matter was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention (i.e., because the disclosure of the cleaning gases in the specification as originally filed was limited to fluorine- and chlorine-containing gases, not the broader genus of halogen-containing gases in general). Please note that dependent Claims 15, 16, 31, and 32 have not been rejected under 35 U.S.C. 112, first paragraph, because these claims recite specific cleaning gases that were disclosed in the application as originally filed.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in the previous Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. The rejection of Claims 11 and 27 under 35 U.S.C. 102(b) as being anticipated by Dietz et al. (USPN 4,452,642), set forth in paragraph 10 of the previous Office Action, is withdrawn in light of applicant's amendment D. Specifically, amended independent Claims 11 and 27 now require that the cleaning gas contain at least one halogen atom. This limitation is not taught by Dietz et al. alone.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 11, 12, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bluck et al. (USPN 6,101,972) in view of Dietz et al. (USPN 4,452,642) and Matsuyama (USPN 5,149,375), for the reasons set forth in paragraphs 13 – 14 of the previous Office Action and below.

12. Specifically, independent Claims 11 and 27, as amended, further require that the cleaning gas contain at least one halogen atom. This limitation is met by the combination of Bluck et al., Dietz et al., and Matsuyama (see paragraph 14 of the previous Office Action, and Col.4, lines 6 – 46 of Bluck et al., which teaches chlorine-containing and fluorocarbon etching gases for cleaning chamber walls).

13. Claims 13, 14, 29, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bluck et al. (USPN 6,101,972) in view of Dietz et al. (USPN 4,452,642) and Matsuyama (USPN 5,149,375), and in further view of Iwasaki et al. (JP 03-226578 A), as set forth above in paragraph 12 and in paragraphs 15 – 16 of the previous Office Action.

14. Claims 15, 16, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bluck et al. (USPN 6,101,972) in view of Dietz et al. (USPN 4,452,642) and Matsuyama (USPN 5,149,375), and in further view of Hatano et al. (USPN 5,709,757), as set forth above in paragraph 12 and in paragraphs 17 – 18 of the previous Office Action.

Terminal Disclaimer

15. The terminal disclaimer filed as paper #15 on 4/14/2003 (with a certificate of mailing dated 4/7/2003) disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of USPN 6,375,756 has been reviewed and is accepted. The terminal disclaimer has been recorded. As such, the obviousness-type double patenting rejections based on USPN 6,375,756, set forth in paragraphs 26 – 29 of the previous Office Action, are withdrawn.

Response to Arguments

16. The applicant's arguments filed on 4/14/2003 have been fully considered but are not persuasive.

17. First, the applicant argues that Bluck et al. teaches a plasma processing system and method and does not correct the shortcomings of Dietz et al. (i.e., that the cleaning gas must contain at least one halogen atom). In response to applicant's arguments against the Bluck et al. reference individually, one cannot show non-

obviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Further, the examiner notes that Bluck et al. does teach chlorine-containing and fluorocarbon etching gases for cleaning chamber walls/components (see paragraph 14 of the previous Office Action, and Col.4, lines 6 – 46 of Bluck et al.).

18. Second, the applicant argues that Matsuyama teaches activating gases for depositing a film within a chamber rather than removing a deposited film, and thus teaches away from applicant's invention. In response to applicant's arguments against the Matsuyama reference individually, one cannot show non-obviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The examiner has not argued or stated that Matsuyama teaches removing a deposited film by activating cleaning gases with a hot element – this limitation is taught by Bluck et al. Matsuyama has been cited by the examiner to show that platinum is a desirable material to use as a hot filament to activate process gases because of its heat and reaction resistance. A platinum hot filament would possess these desirable qualities regardless of whether the filament is utilized to activate deposition gases or to activate etching gases.
19. Third, the applicant notes that the specific examples provided by Matsuyama describe using a tungsten filament to activate gases such as Si_2F_6 and GeF_4

(Example 5), while the applicant believes that tungsten is not suitable in a situation where a gas containing a halogen atom is used. The applicant then states that Matsuyama would not have recognized that a platinum filament is not etched and is stable when used with a halogen-containing cleaning gas. In response, the above arguments are simply speculation on the part of the applicant. There is no evidence on the record to suggest that one of ordinary skill in the art, at the time of the applicant's invention, would have expected a platinum hot filament not to function successfully in activating halogen-containing cleaning gases. Briefly, Bluck et al. teaches using a hot-filament in general to activate gases such as argon, fluorocarbons, chlorine-containing gases, hydrogen, and/or oxygen in order to clean/etch the walls of a reaction chamber (Col.4, lines 6 – 46, Col.6, lines 32 – 67, and Col.7, lines 1 – 6). Since Bluck et al. is silent as to the material used to form the hot-filament, one of ordinary skill in the art would have been motivated to seek out an appropriate material for this purpose. Dietz et al. teaches that platinum is a suitable material for a hot-filament that is used to activate cleaning gases, and Matsuyama teaches that platinum is a desirable material to use as a hot-filament to activate process gases because of its heat and reaction resistance. Therefore, one of ordinary skill in the art would have clearly had (1) a reasonable expectation of success in choosing a platinum hot-filament to activate the chlorine-containing and/or fluorocarbon cleaning gases taught by Bluck et al., and (2) a motivation to choose platinum as the hot-filament material due to its heat and reaction resistance, as taught by Matsuyama.

20. Fourth, the applicant argues that, even if the cited references could be combined, the resulting structure would not render obvious the applicant's claimed invention. In response, the examiner disagrees. Specifically, the combination(s) of references cited by the examiner reasonably suggest each and every limitation of the applicant's claims (see paragraphs 13 – 18 of the previous Office Action).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koinuma et al. (USPN 5,221,427) teaches that, in the art of forming a plasma from a chlorine- or fluorine-containing gas that has a strong etching action, a center conductor that is exposed to the plasma should be composed of platinum, which is unlikely to be etched by a halogen element (Col.3, lines 63 – 68, and Col.4, lines 1 – 4).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (703) 308-7557. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Wesley D Markham
Examiner
Art Unit 1762

WDM
June 10, 2003

SHRIVE P. BECK
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700